



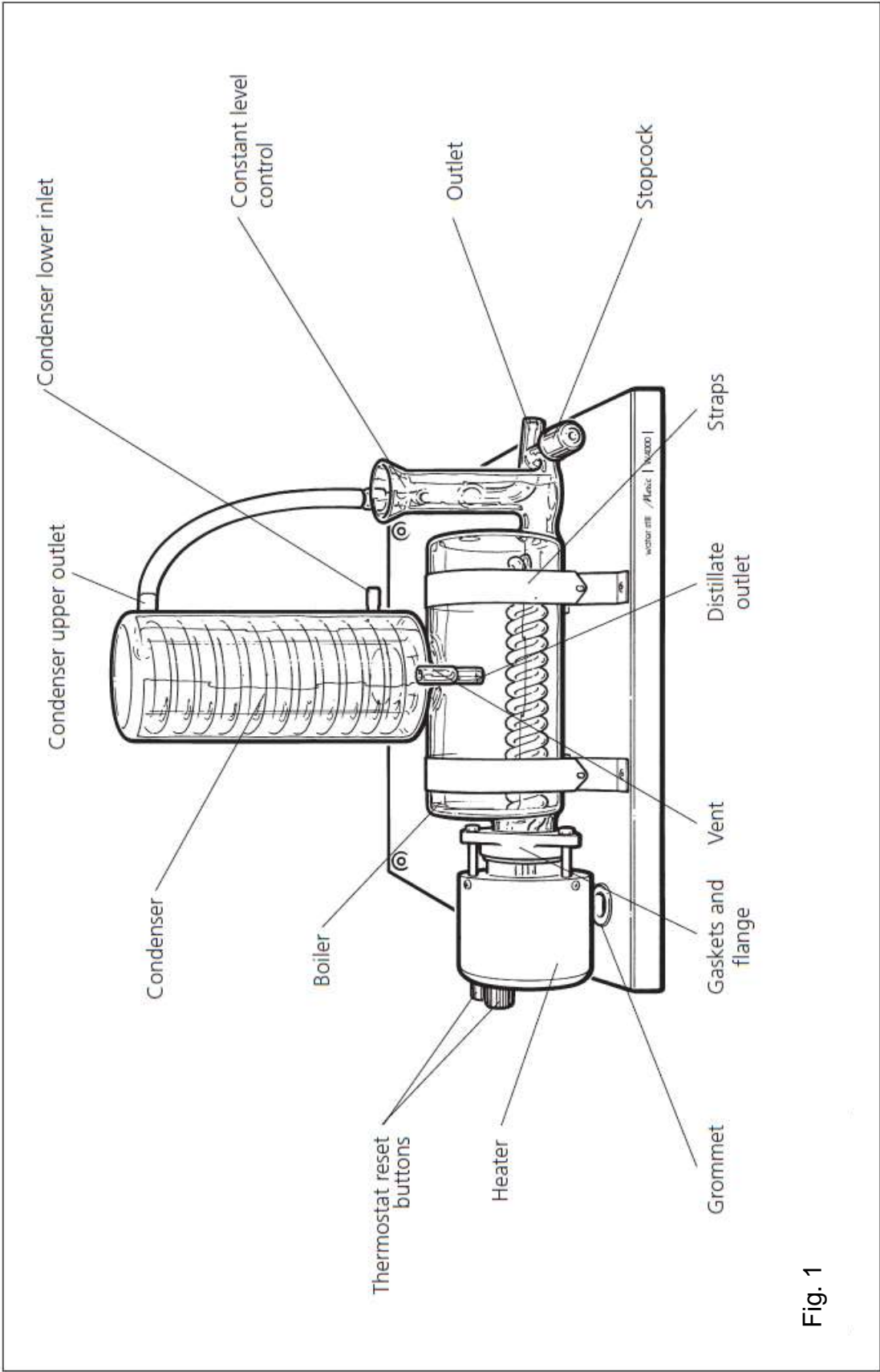
Merit

W4000 & W4000/EURO Water Still



Assembly and Operating Instructions

Merit W4000 & W4000/EURO Water Still



Before Use

If the equipment is not used in the manner described in this manual the protection provided by the equipment may be impaired.

N.B. The Merit Water Still is classified as 'Permanently Connected Equipment' and should be connected to the electricity supply by a qualified electrician in the manner described in the electrical installation section of this manual.

The Merit Water Still is designed to operate under the following conditions:

- For indoor use
- Ambient temperature range +5°C to +40°C
- Altitude up to 2000m
- Relative humidity not exceeding 80%
- Mains supply voltage fluctuations not greater than $\pm 10\%$ of nominal
- Overvoltage category II IEC60364-4-443
- Pollution degree 2 IEC664



The Distinction Water Still complies with the following European Directives:
89/336/EEC - E.M.C. DIRECTIVE
Amended by 92/31/EEC and 93/68/EEC
73/23/EEC - L.V.D. Amended by 93/68/EEC

Limitations of use

This product meets the applicable E.C. harmonised standards for radio frequency interference and may be expected not to interfere with, or be affected by other equipment with similar qualifications. We cannot be sure that other equipment used in its vicinity will meet these standards and we cannot guarantee that interference will not occur in practice. Where there is a possibility that injury, damage or loss might occur if equipment malfunctions due to radio frequency interference, or for general advice before use, please contact the Technical Service Department of Bibby Scientific Ltd.

Issue	Date	Reason
1	February 2014	Initial Issue
2	December 2014	Addition of thermostat reset button photos

Contents

Location	p.5
Assembly	p.6
Electrical Installation	p.10
Operation	p.11
Safety Cut-Outs	p.12
Care and Maintenance	p.14
Cleaning	p.14
Spares	p.16
Warranty	p.16
Fault Finding	p.17

Location

The Merit Water Still can be wall or bench mounted. Select a convenient location which has access to the following services:

Electrical Supply

Before connection please ensure that the line supply is suitable. The Merit Water Still is available in two models, model no. W4000 for supplies rated at 3kW, 220-240V 50/60 Hz single phase and model no. W4000/EURO for supplies rated at 3kW, 200-240V, 50/60 Hz, single phase. Supplies should be fitted with a 30mA RCD circuit breaker.

Water Supply

A cold water supply capable of providing a minimum flow rate of 60 l/hr. Ensure all water supplies are earth bonded.

Drain

A waste water drain located below the level of the still so that the drain pipe can fall away straight without kinks or bends, to allow an unimpeded flow. Ensure all drainage systems are earth bonded.

Reservoir

A distillate collection reservoir should be located beneath the still.

Assembly

Your Merit W4000 has been designed with ease of assembly specifically in mind. Before commencing assembly please study the illustrations and text to familiarise yourself with the general layout. During assembly, follow the sequence of instructions and do not connect the mains electricity supply until directed.

1. Unpack the Still and identify the following components:

Qty.	Component	Catalogue No.
1.	Boiler Stand with 2 Boiler Straps	I/W4000/S
1.	Boiler	I/W4000/B
1.	Condenser	I/WC48/M2/1
1.	Heater	700692(ES) for W4000 700693(ES) for W4000/EURO
1.	Hose Kit	I/W4000/HK
1.	Gasket Kit	I/MERIT/GK

2. Take the metal stand and place in the desired location. Note that 2 screw holes are provided for wall mounting.

3. Take the boiler (W4000/B), the heater (700692(ES)) and the gasket kit (I/MERIT/GK) and assemble as shown in Fig. 2 and the following:

- i. Place the bolts through the metal flange in the manner shown and then place the metal flange over the tapered glass tube of the boiler.
- ii. Take the plastic insert and bend it round the tapered glass tube of the boiler and into the metal flange. Pull the flange and insert towards the open end of the tapered glass tube until the insert presses on the glass.
- iii. Place the rubber gasket over the heater coils.

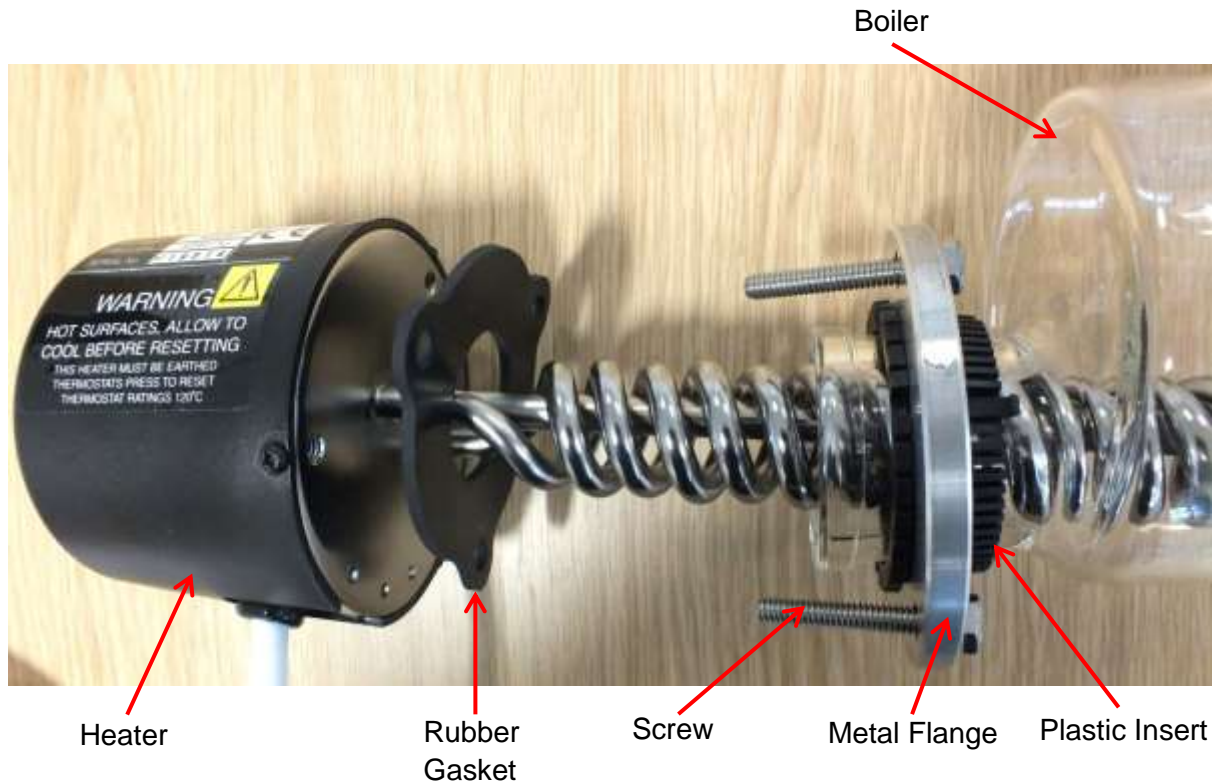


Fig. 2

- iv. Insert the heating element through the tapered glass tube and into the boiler.
- v. Insert the three bolts into the threaded holes in the heater and evenly tighten as Fig. 3. Do not over tighten.



Fig. 3

4. Connect the springs of the 2 metal straps to the rear of the cradles.
5. Feed the heater electric cable through the hole in the base of the support stand. Place the boiler and heater assembly in the cradle of the stand. Ensure the stop cock on the boiler is facing the front. Attach the free ends of the metal straps to the front of the cradles to secure the boiler in place as Fig. 1.
6. Close the stop cock and remove any covers off the boiler.
7. Ensure the Sealing O Ring and Stabilising O Ring are correctly positioned, as shown in Fig. 4.

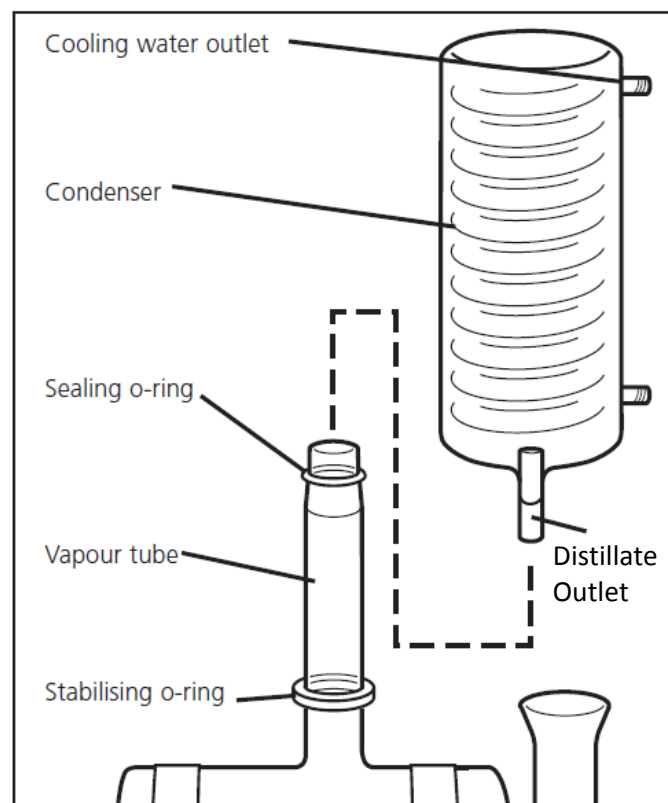


Fig. 4

8. Fit the condenser distillate outlet tubing and tie strap (not included).
9. Fit the condenser by mounting it onto the vapour tube of the boiler. Ensure the distillate outlet tube of the condenser faces the front and the cooling water outlet faces parallel to the unit as Fig. 4. When resistance is felt, push down slightly to create a seal until there is approximately a 5 – 10mm gap between the condenser and the boiler.

10. From the hose kit take the length of 8mm bore hose fitted with the plastic screw thread connectors at either end. Referring to Fig. 1, screw one end of the hose to the condenser outlet (upper) and the other end to the glass thread on the constant level control.
11. Fit the spare connector to the condenser inlet connection (lower). This is to allow connection to the water supply. Use suitable, good quality tubing and hose clips (Not included).
12. Take the 1m length of 16mm tubing from the hose kit. Insert the end in hot water to make it more supple. Attach to the drain/outlet of the constant level control. Secure with the tie strap provided. Ensure the tubing falls away from the still with no kinks or bends to impede water flow.
13. Turn on the water supply and check for leaks.
14. Carry out the electrical installation.

Electrical Installation



THIS EQUIPMENT MUST BE EARTHED!

The electrical Installation should be carried out by a qualified electrician. The following method is recommended.

The earthed spigots should pass a high current (i.e. >200mA) earth continuity test.

The equipment is supplied with a 1.7m of flexible triple core circular cable to CMA 3183 TQ specification. The conductors are 1.5mm² to BS 6360 Class 5 insulated with E.P.R. The outer sheath is 85°C heat resisting type C.S.P. to HOFR, BS 6500 Table 9.

Connection to the mains electrical supply should be via a double pole 30mA RCD isolation circuit breaker with a continuous current carrying capacity of 15A at 250V and overcurrent protection of 15A, 250V.

These devices should be sited near to the equipment and be clearly marked "Disconnect device for 'Merit' Water Still".

Connect to the line supply noting that the wires in the instrument lead are coloured in accordance with the following code:

Blue – Neutral

Brown – Live

Green & Yellow – Earth

Main Cable Replacement

If the mains cable requires replacement, only specially prepared spare mains lead obtained from Bibby Scientific should be used.

Hot Warning!



Some parts of the product may become hot during use. These are clearly marked with 'Hot Warning Labels. Avoid touching these parts.

Operation

1. Turn on the cold water supply and adjust the flow to approximately 60 l/hr.

Note: It is strongly recommended to measure the flow rate, failure to do so can result in possible injury from hot water exiting from the Still. If a flow meter isn't available, a simple measurement can be performed with a 1l beaker. Over a timed period of five minutes the breaker should be completely filled five times.

Observe that the water flows via the condenser and into the boiler. Wait until the boiler has attained its correct operating level and make sure that the excess water is flowing to drain.

2. Switch on the electricity supply to the heating element at the mains isolation switch.

For the W4000/EURO version, switch on the switch situated on the heater.

3. After a few minutes the water will start to boil and distillate will emerge from the condenser. With new glassware, or after cleaning, it is advisable to allow this to run to drain for approximately 30 minutes before beginning collection.
4. To turn off the still, first turn off the heating element but allow cooling water to continue for a further 10 minutes to allow the still to cool.

Warning!

Do not use this equipment to distil any liquid other than water.

Safety Cut-Outs

The Merit Water Still is protected by two safety cut-outs:



Boiler heater thermostats

Should the boiler water level fall and expose the element the thermostats will operate and turn off the electricity supply to the element.

After operation of either of the thermostats, normal operation may be resumed by resetting the thermostats by means of their respective reset buttons mounted on the end of the heater end cover.

Remove the black plastic cover and then press the button – a slight click will be heard if the thermostat had operated.



Before resetting either thermostat the still should be allowed to cool completely and the cause of the cut-out operation identified and rectified.



To reset the thermostats the black covers need to be screwed off



Both Thermostats have tripped



The left hand thermostat has been reset

If the thermostats continue to operate, consult a qualified electrician or the Technical Service Department of Bibby Scientific Ltd.

Care and Maintenance

N.B. Before commencing any maintenance, cleaning or fault finding the equipment should be isolated from the mains electricity supply. These operations should only be carried out by suitably qualified personnel.

Only spare parts supplied or approved by Bibby Scientific Ltd or its agent should be used. Fitting of non-approved parts may affect the performance or safety of the equipment.

Due to the nature of these parts it is necessary to periodically check the quality of the plastic connectors and hoses. There should be no strain on the connectors or hoses. Both the hoses and connectors should be intact without any cracking. If any damage is discovered on these parts the Still should immediately be turned off, as detailed under the 'Operation' section of this manual, and not used again before these parts are replaced. Please refer to the 'List of Spare Parts' section of this manual for order codes.

Cleaning

Over a period of operation, scale will build up inside the boiler. To obtain optimum performance this scale should be removed on a regular basis.

The time span between cleaning depends greatly on the hardness of the water supply and the amount of use. Frequently used stills in hard water areas may need descaling once a week whereas in a soft water area several weeks may elapse before descaling is necessary.

N.B. Heavy scaling will reduce distilled water quality and can shorten the life of the heating element.

It is possible to descale the Merit Water Still without dismantling the glassware by following these instructions in conjunction with Control of Substances Hazardous to Health regulations (COSHH) 1988.

1. Switch off the electricity supply to the still and allow it to cool completely.
2. Turn off the cooling water supply.
3. Open the stop cock on the constant level control and allow the boiler to drain completely. Close the stop cock.
4. Turn on the cooling water supply and allow the boiler to fill to approximately half way to its normal operating level. Turn off the water supply.

5. Into the open funnel of the constant level control, carefully add about 1 litre of 10% formic acid or kettle descaler. Do not use strong acids such as hydrochloric, this can cause severe corrosion of the metal heating element.

Warning!

Always handle acids with great care. Protective clothing, gloves and face masks should be worn during the descaling operation. Remove any acid spills immediately.

Turn on the water supply and fill the boiler to the normal operating level. The water will flush the acid into the boiler. The water supply should be turned off when the level in the boiler is slightly below the overflow.

6. Leave the acid in the boiler to dissolve the scale. This may take some time depending on the severity of the build-up.
7. Open the stop cock and allow the boiler to drain:

Note: If the acid in the boiler has not been completely neutralised the liquid flowing to drain may be highly acidic. All necessary safety precautions should be observed around the drain and any effluent control procedures followed.

8. Close the stop cock, turn on the water and allow the boiler to fill with cold water. Turn off the water, re-open the stop cock and allow the boiler to drain.

Repeat this procedure three times.

9. The Merit Water Still may now be restarted by referring to the instructions given under 'Operation' in this manual.

Note: The stand and outer surfaces of the glassware should be cleaned using a damp cloth and a mild detergent solution.

Spares

Boiler	W4000/B
Condenser	WC48/M2
Heater (Complete With Thermostats) (W4000) 240V	A6/6
Heater (Complete With Thermostats) (W4000) 220V	A6/6/EURO
Hose Kit	W4000/HK
Gasket Kit	W4000/GK
Stop Cock Assembly	A4000/RCOCK
Vapour Tube Sealing O Ring (Upper)	WB48/01
Vapour Tube Stabilising O Ring (Lower)	I/QR38/24
Heater Rubber Gasket	700449
Heater Element Plastic Insert	700450

Warranty

Bibby Scientific Ltd warrants this instrument to be free from defects in material and workmanship, when used under normal laboratory conditions, for a period of three (3) years. In the event of a justified claim, Bibby Scientific will replace any defective component or replace the unit free of charge.

This warranty does NOT apply if damage is caused by fire, accident, misuse, neglect, incorrect adjustment or repair, damage caused by incorrect installation, adaptation, modification, fitting of non-approved parts or repair by unauthorised personnel.

This warranty does not include the heater element which is only guaranteed for up to 1000 hours in use.

Fault Finding

In the event of operating difficulties with your Merit Water Still, please consult the following notes. If these fail to identify and remedy the fault you are advised to contact your supplier or the Technical Service Department of Bibby Scientific Ltd.

Note – Fault Finding should only be carried out by suitably qualified people.

Symptom	Cause	Remedy
Heater not working	a. Burnt out heater b. Failed electricity supply c. Thermostat	Replace heater. Restore supply. Identify and rectify the cause and reset thermostat.
Water level in boiler is too low – heater exposed	a. Supply of cooling water is insufficient b. Boiler drain stop cock left open	Adjust the supply to approximately 60 l/hr. Close stop cock.
Water level in boiler is too high – e.g. water surging into condenser	a. Flow of cooling water is too high b. Drain is restricted	Adjust the supply to approximately 60 l/hr. Ensure drain pipe falls freely from Still with no kinks.
Distillate temperature is too high – e.g. >50°C	Supply of cooling water is insufficient	Adjust the supply to approximately 60 l/hr.
Water in boiler is ‘pumped’ out of the boiler to drain	a. Tubing from condenser distillate outlet to the reservoir is constricted b. Mounting for condenser thermostat is blocked c. Supply of cooling water is insufficient	Ensure tubing falls freely from Still with no kinks. Remove obstruction. Adjust the supply to approximately 60 l/hr.
Distillate quality is poor*	Boiler heavily scaled	Clean boiler
Output less than 4 l/hr	a. Mains electricity supply below nominal voltage b. Excessive cooling water flow	Reduce to 60 litres/hr.
Persistent tripping of the RCD	If integrity of the heater is suspect If integrity of the RCD is suspect	Replace Heater Replace RCD

* Distillate quality when measured by pH or conductivity is greatly affected by temperature and the presence of absorbed carbon dioxide.



This product meets the applicable EC harmonized standards for radio frequency interference and may be expected not to interfere with, or be affected by, other equipment with similar qualifications. We cannot be sure that other equipment used in its vicinity will meet these standards and so we cannot guarantee that interference will not occur in practice. Where there is a possibility that injury, damage or loss might occur if equipment malfunctions due to radio frequency interference, or for general advice before use, contact the Technical Department of Bibby Scientific Ltd.



Ce produit est conforme aux normes harmonisées de l'UE applicables aux interférences radiofréquences. Il ne doit donc pas interférer avec d'autres équipements répondant aux mêmes directives, ni être affecté par eux. Comme nous n'avons pas la certitude que tout autre équipement utilisé à proximité respecte ces normes, nous ne pouvons pas garantir l'absence d'interférence dans la pratique. En cas de possibilité de blessure, dommage ou perte suite à un dysfonctionnement de l'équipement en raison d'interférences radiofréquences, ou pour tout conseil d'ordre général, veuillez contacter le Service technique de Bibby Scientific Ltd.

Declaration of Conformity

Water Stills, Model W4000 & W4000/Euro

These products comply with the requirements of the EU Directives listed below:

2004/108/EC **EMC Directive.**
2006/95/EC **Low voltage Directive (LVD)**

Compliance with the requirements of these Directives is claimed by meeting the following standards:

EN 61326-1:2006 (Electrical Equipment for Measurement, Control and Laboratory use).
EN 61010-1: 2001
(Safety Requirements Electrical Equipment for Measurement, Control and Laboratory use)
EN 61010-2-010: 2003 (Particular Requirements for Laboratory Equipment for Heating of Materials).

Compliance Certificates and Full Reports.
 Ref: RETS0287/5 and RETS0287/6

The above certificates and reports, from a independent test house, are available upon request.

CE mark affixed '01.

Signed:  (Mr S. Marriott)

Date: 

Authority: Technical Director
 Bibby Scientific Ltd

Notes



Bibby Scientific France SAS

ZI du Rocher Vert - BP 79
77793 Nemours Cedex
France
Tel: +33 1 64 45 13 13
Fax: +33 1 64 45 13 00
e-mail: bsf@bibby-scientific.fr
www.bibby-scientific.com

Bibby Scientific Ltd

Beacon Road, Stone
Staffordshire ST15 0SA
United Kingdom
Tel: +44 (0)1785 812121
Fax: +44 (0)1785 813748
e-mail: info@bibby-scientific.com
www.bibby-scientific.com

Bibby Scientific US Ltd

3 Terri Lane, Suite 10
Burlington NJ 08016
USA
Tel: 800-225-9243
Fax: 609-589-2571
www.bibby-scientific.com

Bibby Scientific (Singapore) Ltd

Prudential Tower, Level 26
30 Cecil Street
Singapore 049712
Tel: + 65 6631 2976
Fax: +44 (0) 1785 810405
e-mail: info@bibby-scientific.com
www.bibby-scientific.com